RELATÓRIO FINAL		NÚMERO DO DOCUMENTO **CT-RE-001-2023**
NOME DO PROJETO – SUBPROJETO - ATIVIDADE **MapSãoFrancisco – Lower Stretch Francisco River** **Mapping populations in flood zones risk** **Multi purpose dynamic research trimaran – prototype**		DATA DA REALIZAÇÃO **20th February 2023**
CONVÊNIO – PATROCÍNIO – APOIO INSTITUCIONAL **Cooperação HOT – Humanitarian OpenStreetMap Team; UFAL – Universidade Federal de Alagoas; InfoSãoFrancisco**		NO. DO CONTRATO **Sem contrato**
REALIZADOR (ES) **Sociedade Socioambiental do Baixo São Francisco – Canoa de Tolda**		
RESPONSÁVEL **Carlos Eduardo Ribeiro Junior**		CARGO – FUNÇÃO **Coordinator/Developer**
ETAPA (S): **MPDT 001 construction and evaluation**	SITUAÇÃO: **Finished** **Last rev. 22/02/2023**	USO: **MapSãoFrancisco/partners**
NOTA:		VERSÃO Português - **English**

1. Background

This report is an update of the previous report, CT-RE-003-2022, with the evolution of the **Multi-purpose Dynamic Research Trimaran** project.

Since the application of the tests with the first and rudimentary experiment which was the model made in foam (during the training activities with the HOT - Humanitarian OpenStreetMap Team in June/July 2022), the project has evolved to the realization of digital modeling of the concept.

2. Trimaran digital modeling

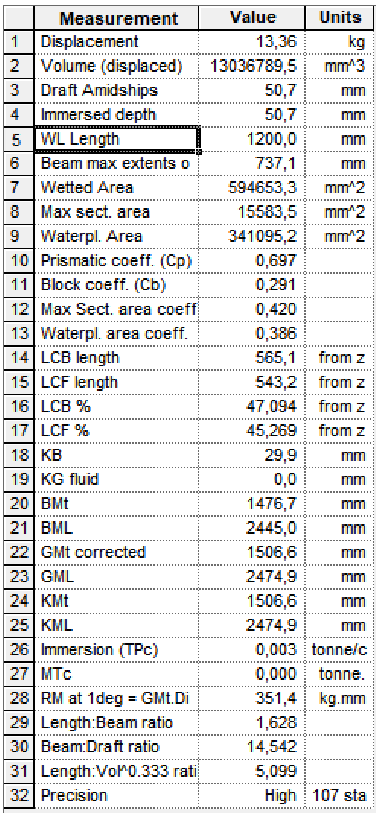
The premise of the digital model project was the development of multipurpose equipment (the trimaran): both for monitoring activities with the support of a motorized mother vessel, but also the possibility of autonomous versions (with electric motorization) for activities where it is human presence is impossible or inadvisable.

Thus, the design of the cell (central hull and floats) was carried out for a maximum displacement of around 13 (thirteen) kilos, allowing the installation of various equipment in all versions (non-motorized and autonomous), including an ADCP.

The digital model presented here is the final version, whose line drawings will generate the first prototype to be built in epoxy wood. All model data can be exported in different types of files in order to be used in different printing systems, CNC, etc.

The choice of material is due to the ease of construction, low weight, final resistance of the compound and the possibility of modifications at any time after the tests in the water.

However, construction of the trimaran is foreseen in numerous other materials, with PVC foam (closed cells) and fiberglass, machining (CNC) in foam and/or low density wood, or even foam block and/or carved wood. the hand.



	Measurement	Value	Units
1	Displacement	13,36	kg
2	Volume (displaced)	13036789,5	mm^3
3	Draft Amidships	50,7	mm
4	Immersed depth	50,7	mm
5	WL Length	1200,0	mm
6	Beam max extents o	737,1	mm
7	Wetted Area	594653,3	mm^2
8	Max sect. area	15583,5	mm^2
9	Waterpl. Area	341095,2	mm^2
10	Prismatic coeff. (Cp)	0,697	
11	Block coeff. (Cb)	0,291	
12	Max Sect. area coeff	0,420	
13	Waterpl. area coeff.	0,386	
14	LCB length	565,1	from z
15	LCF length	543,2	from z
16	LCB %	47,094	from z
17	LCF %	45,269	from z
18	KB	29,9	mm
19	KG fluid	0,0	mm
20	BMt	1476,7	mm
21	BML	2445,0	mm
22	GMt corrected	1506,6	mm
23	GML	2474,9	mm
24	KMt	1506,6	mm
25	KML	2474,9	mm
26	Immersion (TPc)	0,003	tonne/c
27	MTc	0,000	tonne.
28	RM at 1deg = GMt.Di	351,4	kg.mm
29	Length:Beam ratio	1,628	
30	Beam:Draft ratio	14,542	
31	Length:Vol^0.333 rati	5,099	
32	Precision	High	107 sta

Figure 1 - Hydrostatics table

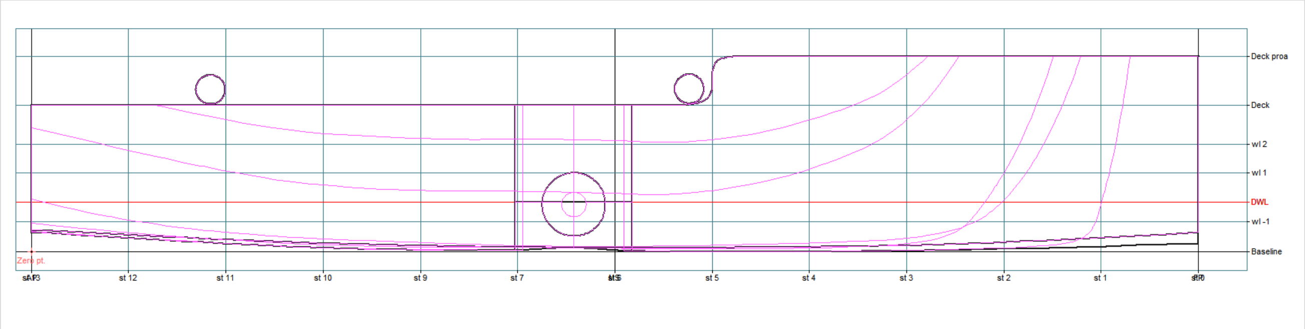


Figure 2 - Lines drawing - profile

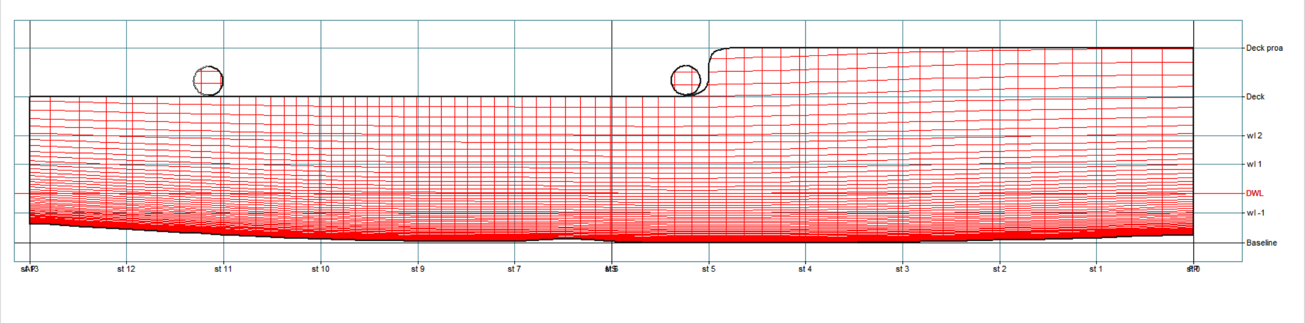


Figure 3 - Parametrics – profile

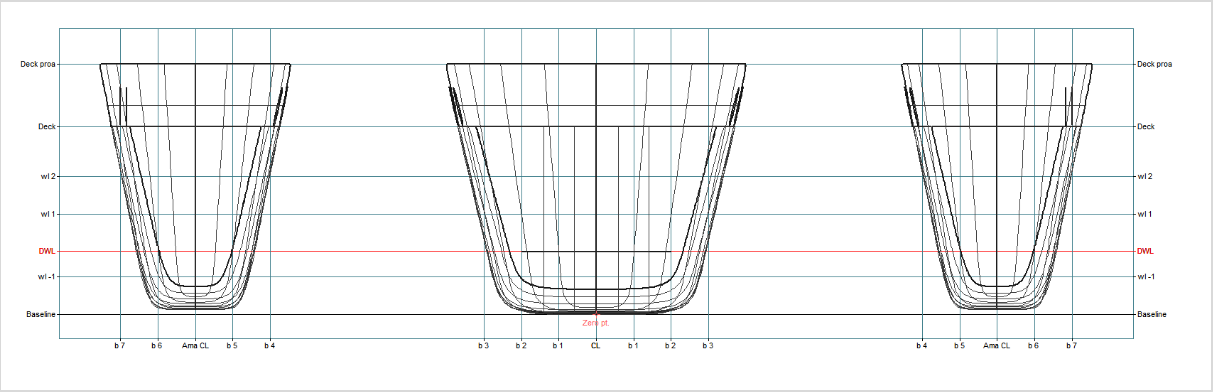


Figure 4 - Lines drawing - front view

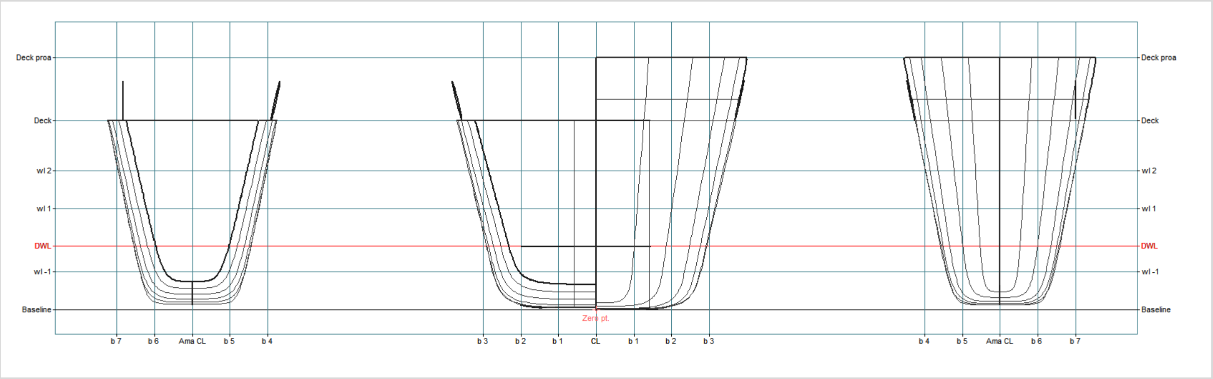


Figure 5 - Lines drawing - front/aft views

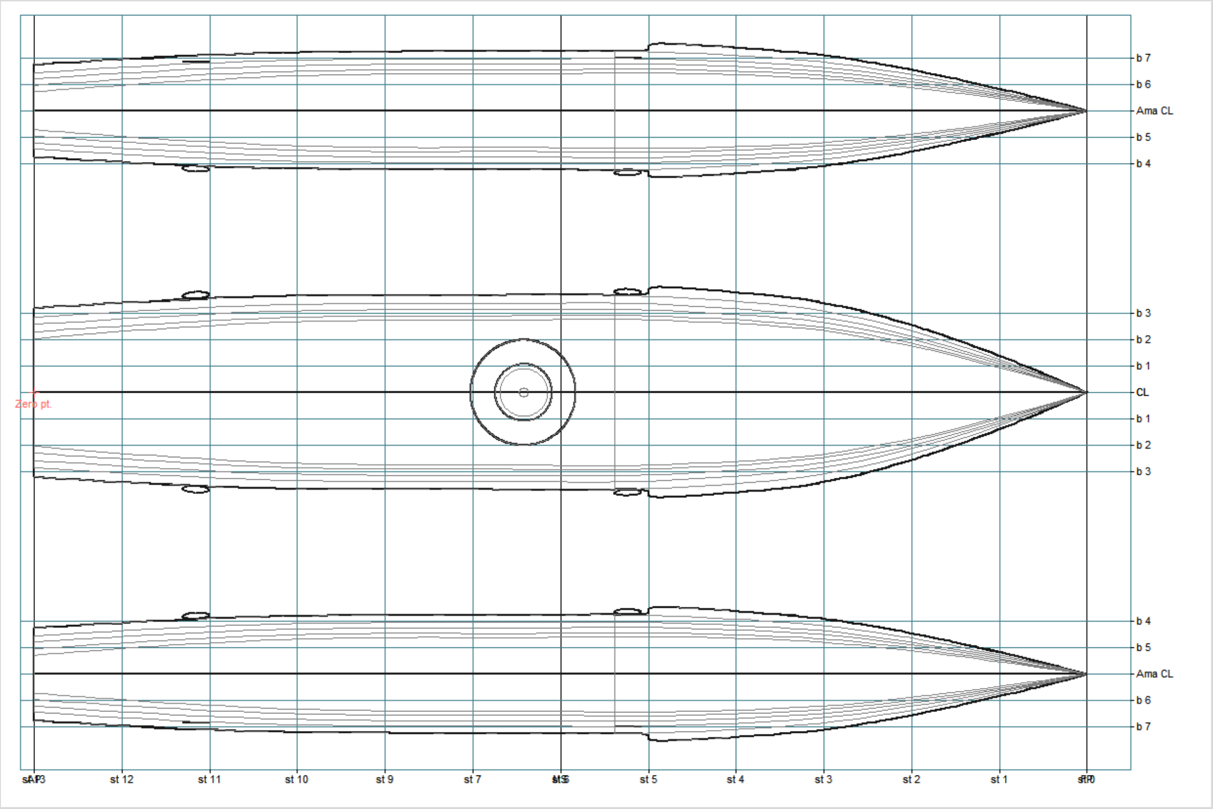


Figure 6 - Lines drawing - upper view

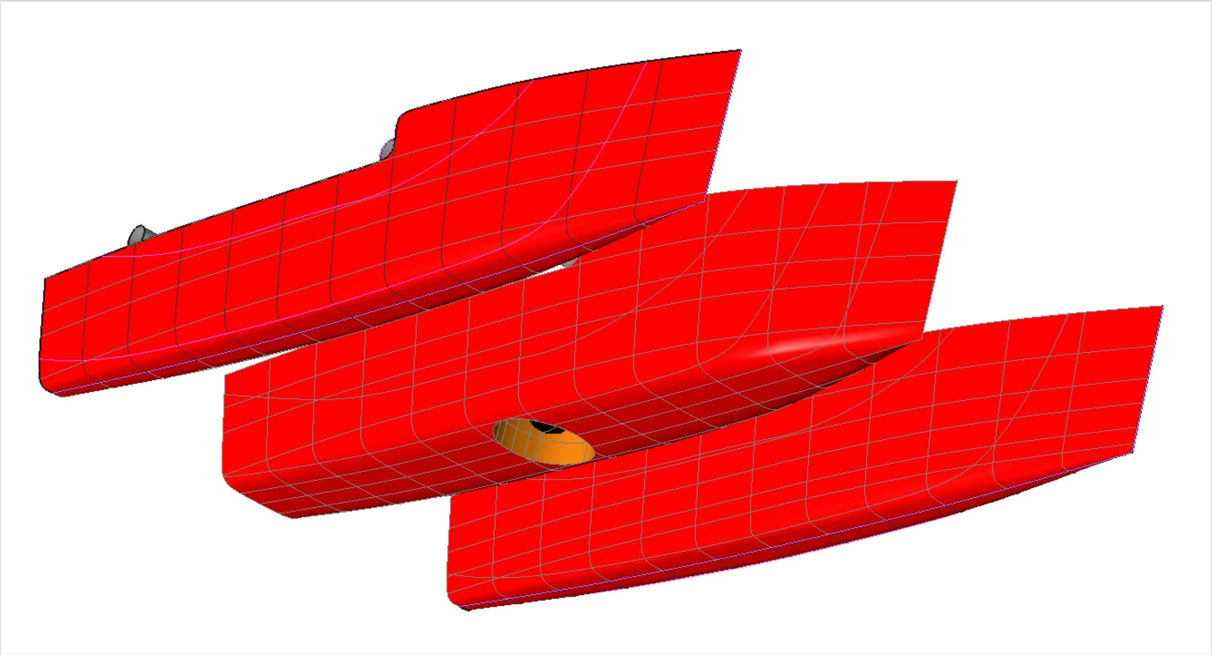


Figure 7 - Perspective - 3D - sections and waterlines

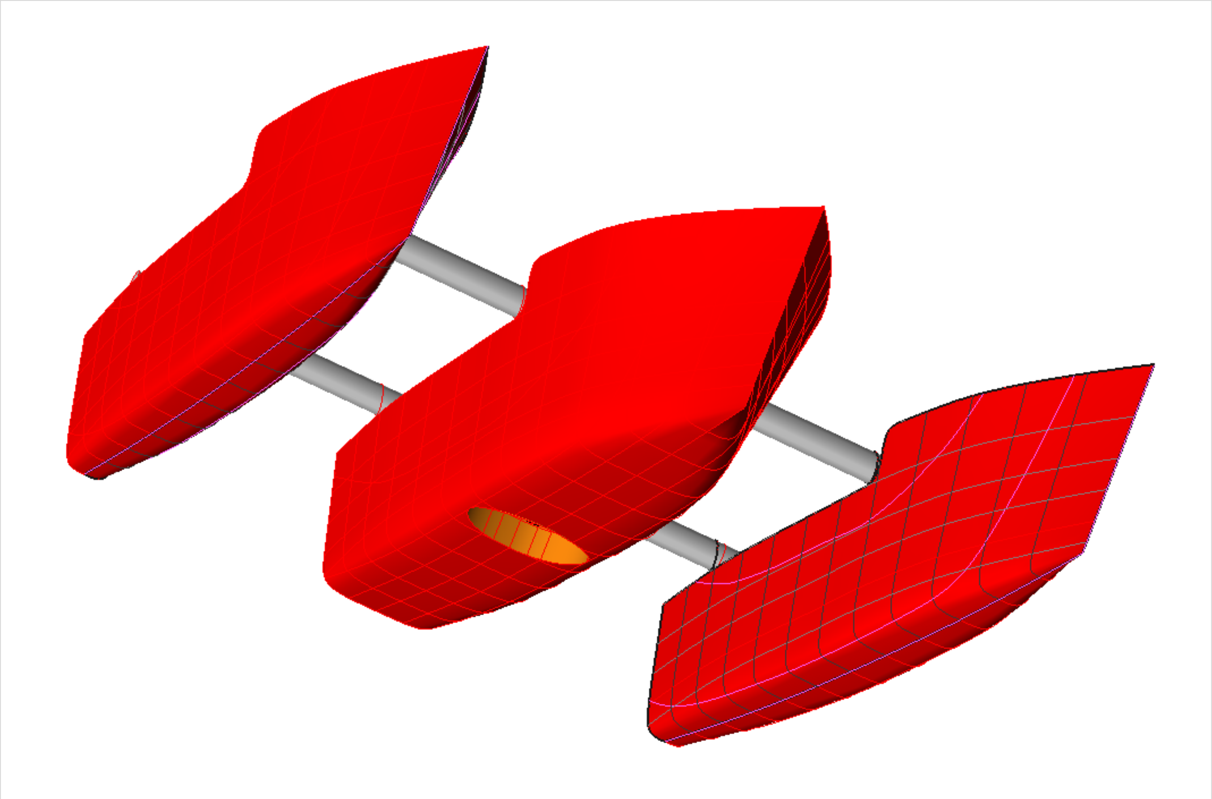


Figure 8 - Perspective

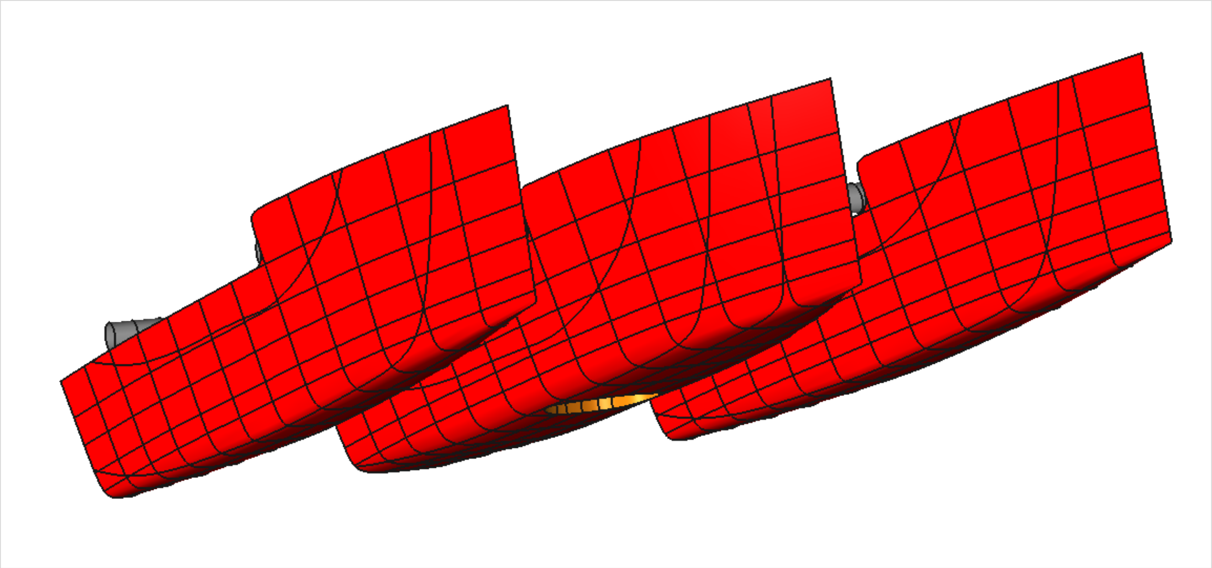


Figure 9 - Perspective

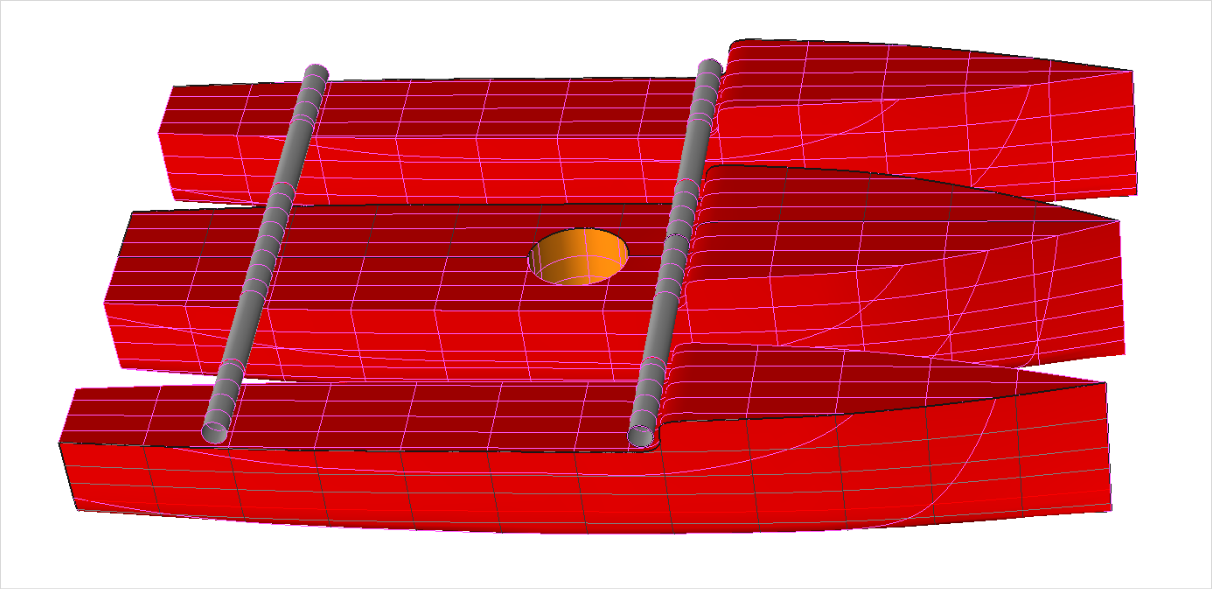


Figure 10 - Perspective

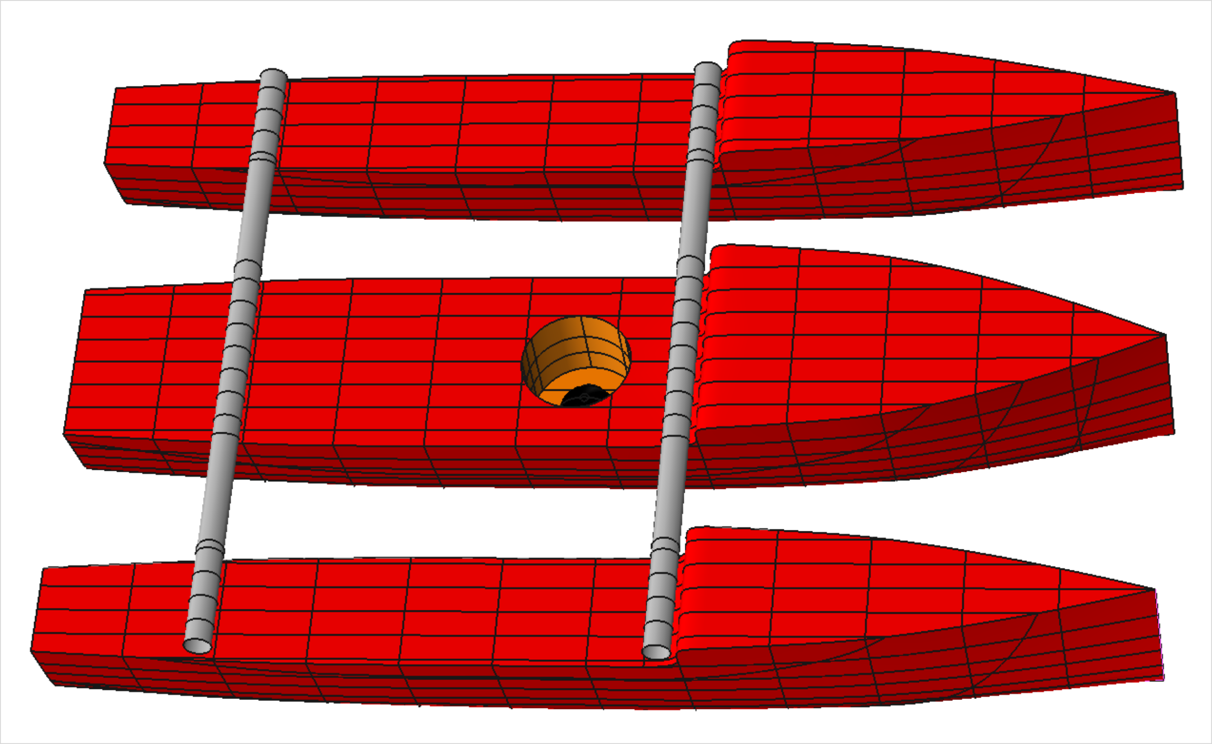


Figure 11 - Perspective

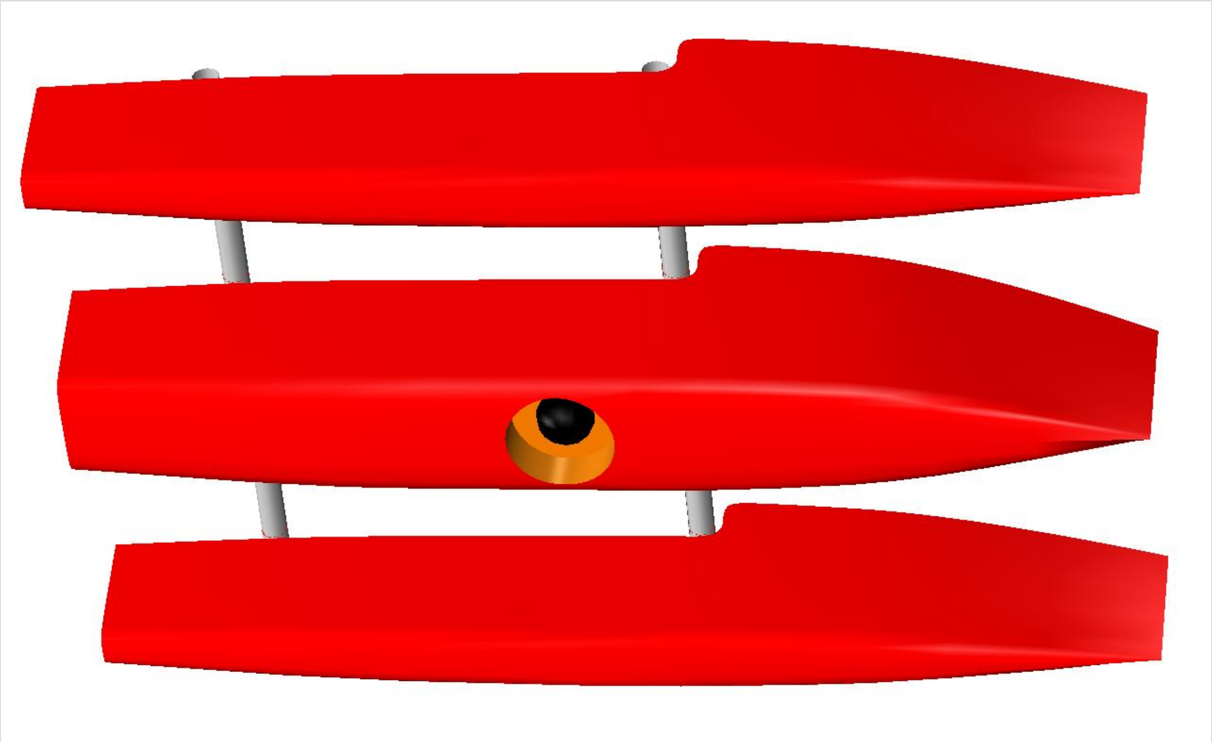


Figure 12 - Perspective

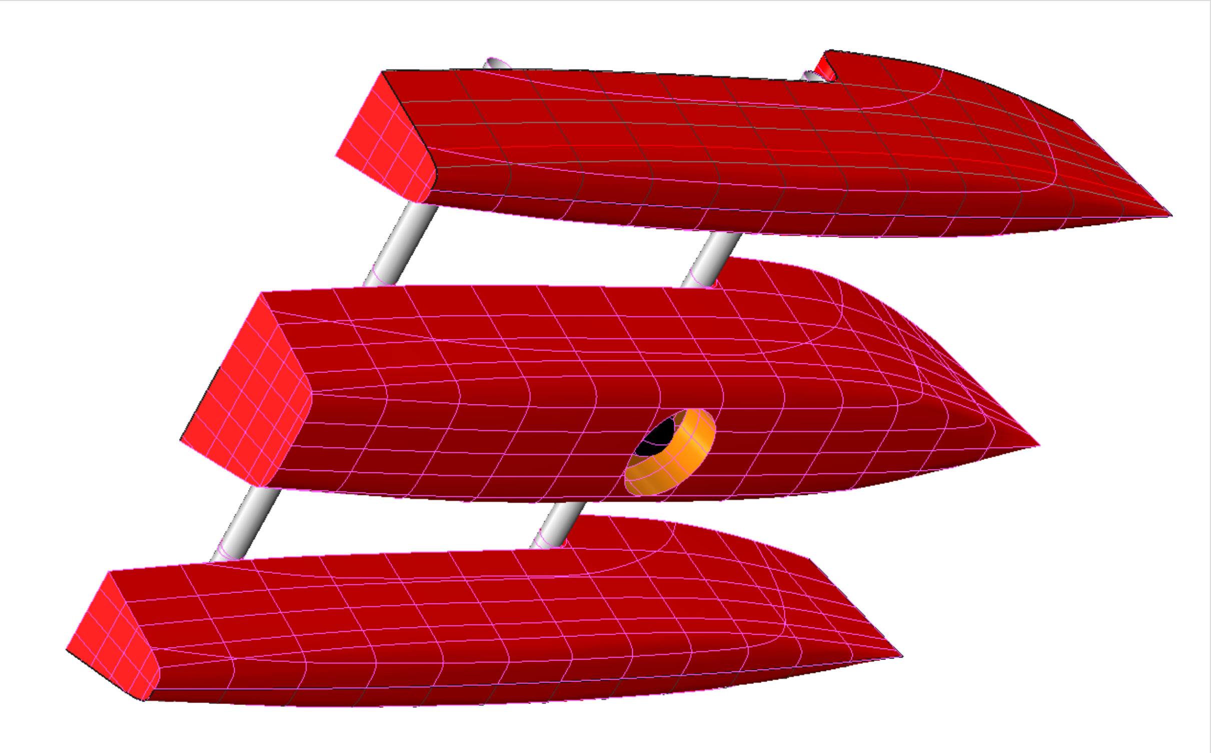


Figure 13 - Perspective

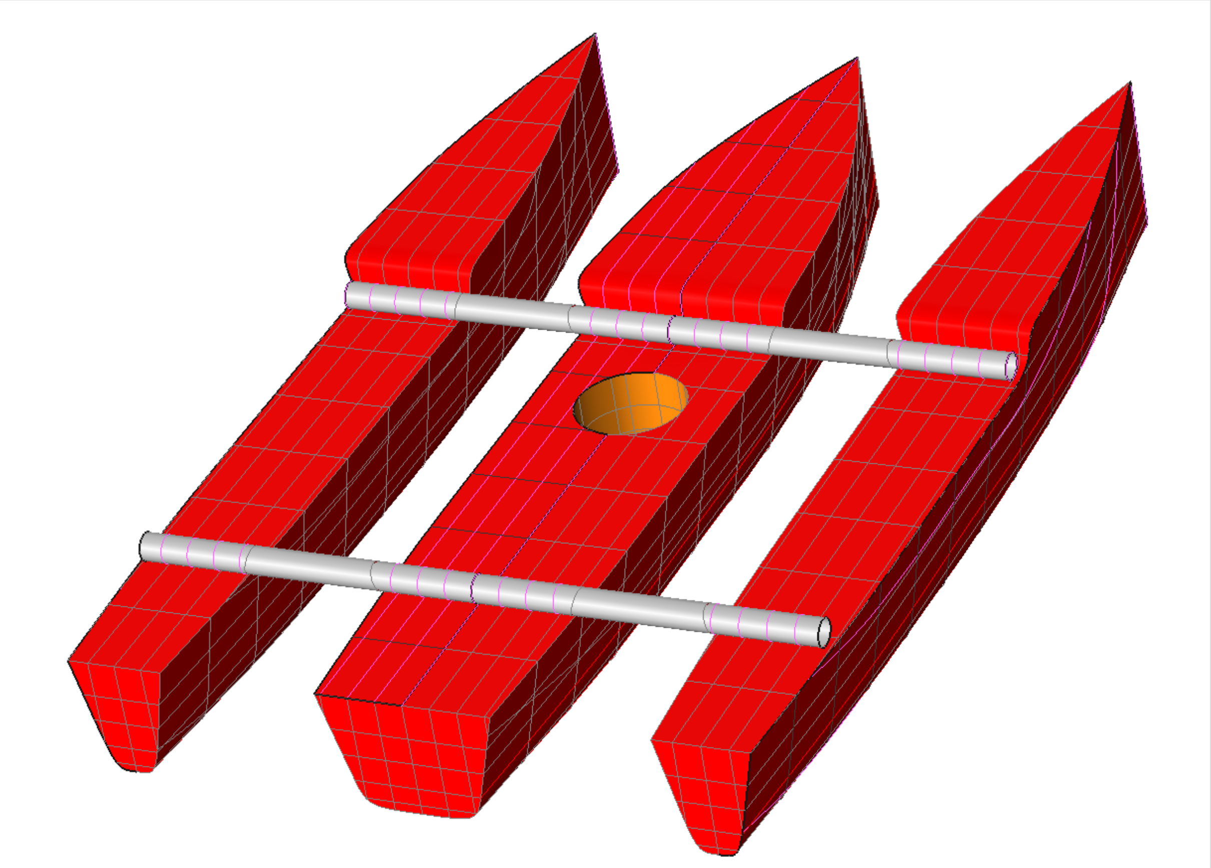


Figure 14 - Perspective

3. Conclusion

The basic concept of the monitoring trimaran is frozen and ready for the generation of data for the construction of the prototype.

Navigation simulations were carried out in different sea situations, with positive results.

4. Next steps

The next steps are directly related to the allocation of financial and physical resources for the construction of the prototype (two units), carrying out tests in the water, eventual improvements, modifications and closure of the standard series model.

Reserva Mato da Onça, 22 de fevereiro de 2023

Carlos Eduardo Ribeiro Junior